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ABSTRACT

All 16 Southern Regional Education Board (SREB) states have high school students receiving courses electronically, according to a recent SREB survey of state departments of education. Courses are delivered electronically to high school students in the SREB region primarily through three methods: satellite, compressed video, and the Web. Although only a small number of high school students now take Web-based courses, the Web shows great promise for instructional use and the number of students is increasing. The SREB Educational Technology Cooperative is working closely with SREB states to determine how states can share resources to provide Web-based courses for high school students. These efforts are designed to: coordinate and assist states in this new, rapidly evolving method of delivering instruction; meet students' academic needs through Web-based courses, especially in core academic subjects; minimize policy-related, instructional, financial and managerial barriers to student access to quality academic courses; and help districts and schools within a state avoid the initial costs and time associated with developing Web-based courses by enabling them immediately to offer online courses that are already available to students. As Web-based technology matures in the next several years, policy-makers and decision-makers will need to focus on several key areas: policy, regulation and legal issues related to developing, offering and receiving courses delivered over the Web; financial issues surrounding this new method of delivering instruction; and management issues at the school level. (AEF)

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Electronic Delivery of High School Courses: *Status, Trends and Issues*

All 16 Southern Regional Education Board states have high school students receiving courses electronically, according to a recent SREB survey of state departments of education.

Distance learning remains more prevalent in higher education; the survey indicated that only a small number of high school students take classes through distance learning. However, interest in increasing the use of the Web to deliver instruction is growing tremendously.

While access to electronically delivered courses can benefit any high school student, it is most essential for the following types of students:

- students attending schools that are unable to provide certain academic courses;
- students who need an alternative to traditional education;
- students who have some access to courses but want alternatives to courses offered in their high schools;
- students with physical disabilities or students with prolonged absences from school because of illness; and
- home-schooled students.

How can these students have access to the courses they need to succeed in school and adequately prepare for their future? Courses are delivered electronically to high school students in the SREB region primarily through three methods: satellite, compressed video and the Web. Television instruction delivered by satellite, which has been used longer than the other methods, still serves the largest number of students taking electronic courses. Although the cost has declined, satellite delivery requires students to be at a specific location at a specific time and therefore has not met predictions for expansion. Satellite delivery likely will continue to be used in states where it is well-established.

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Generally, states that continue to use satellite instruction tend to focus on higher-level, Advanced Placement and foreign language courses. According to the Virginia Department of Education, Virginia has more courses delivered by satellite than other states. During the 1998-99 school year, more than 1,850 Virginia students received courses via satellite. These courses included AP courses in statistics and English; Japanese 1, 2 and 3; and German 1 and 2. Test results show that students taking these satellite-delivered courses passed AP exams at a "significantly higher rate than the national average."

Mississippi provides calculus, physics, Japanese, Latin 1 and 2, Spanish 1 and 2, and German 1 and 2 via satellite. Legislative funding in Texas provides districts with satellite systems to access academic courses, and school districts select the programming providers and courses they feel best meet their students' needs. In South Carolina the Instructional Television Fixed Service (ITFS) allows school districts to transmit four channels of closed-circuit programming to schools within a district from a central transmitter site. During the 1998-99 school year 601 students participated in the ITFS.

A few states use compressed video, which appears to be gaining in acceptance because the technology is becoming increasingly affordable and available. The Mississippi Educational Network provides a full range of academic courses via compressed video. During the 1998-99 school year 4,224 students participated in compressed-video courses. Virginia and Louisiana are increasing their use of compressed video as an alternative way to deliver instruction in high schools.

Some states continue to use a combination of technologies for distance learning. Louisiana uses a program that combines conference calling with computer graphics. The program, called Telelearning, served 1,609 students last year and has been used for more than 10 years.

Interest in Web Courses

Although only a small number of high school students now take Web-based courses, the Web shows great promise for instructional use and the number of students is increasing. State departments of education staff who responded to the SREB survey expressed an overwhelming interest in increasing the use of Web-based courses for high school students.

The region's largest Web course initiative for high school students is the Florida High School, a virtual high school based in Orlando. The Florida High School offered 46 courses in fall 1999, including AP Biology, AP Calculus and "Critical

Thinking and Study Skills — SAT Preparation," with more than 1,700 students enrolled. Since it began in 1997, the initiative has received more than $9 million from the Florida Legislature. Its goal is to offer the full program of academic courses for high school students by fall 2001.

Across the SREB region, some high school students have access to Web courses that are developed and offered through special projects or by universities or school districts. Students in several SREB states are taking courses through the Concord Consortium, a federally funded project in Massachussetts that trains teachers to develop and offer courses. Schools in Alabama, Georgia, North Carolina, Texas and Virginia started participating during the 1998-99 school year. The University of Texas at Austin is developing and offering Web-based courses for high school students in that state. The Unified Independent School District in Texas has received funding from the U.S. Department of Education for its Project Millennium, which will provide courses to 30 schools. The Houston Independent School District also is developing a virtual high school.

Are Web-based courses for high school students the long-sought "silver bullet" that will meet students' academic needs in the SREB states? To realize the method's potential, the use of Web-based courses must be given adequate time and support. The SREB Educational Technology Cooperative has examined this problem in the last year and issued a report called *Essential Elements for Web-based Courses for High School Students.* This report highlighted the urgent need to resolve critical issues related to policy, instruction, management and funding in order to provide academic courses to high school students through distance learning. Among the related topics that must be addressed are quality of courses, tuition and fee arrangements, adequate technical support for teachers and students, and student evaluation.

Web Course Issues

Some important issues surrounding the use of the Web in teaching high school students are beginning to emerge:

1. All students should have access to core and higher-level courses, such as Advanced Placement courses, that are critical for high school students. Ideally, a full range of elective courses would be available, but these courses are not immediately essential.

2. It is costly and time-consuming to develop high-quality, interactive Web-based courses. Because this is a new technology, the initial development of each course takes at least six months and the cost estimates for the necessary personnel,

equipment, software and technical support frequently exceed $200,000 per course. Should many states or projects develop the same Web-based course? If one state develops and offers a quality algebra course, should other states create algebra courses or participate in arrangements to share? Should the focus be on implementation rather than on development? Many of the serious issues related to policy, regulation, funding and management occur in the implementation of these Web-based courses rather than in their development.

3. Fewer than 5 percent of teachers and students have had experience using Web-based courses. Most teachers do not have the skills needed to develop and offer Web-based courses. In addition, the technology to develop and offer courses changes rapidly, and new products are introduced almost daily. Finally, widespread use of Web-based courses is not available because the level of technology to offer and receive Web-based courses is insufficient and the technology is not evenly distributed within states. E-Rate discounts and other support to improve schools' telecommunications capacity are improving the availability of technology. Unfortunately, though, the students who most need these opportunities often attend the schools with the most limited resources.

4. Web-based courses will require more independent work than many students have experienced. As courses are developed, it is important to devise procedures for monitoring student work and provisions for frequent interaction with the teacher. Students who are not self-directed or self-motivated will need more interaction and follow-up.

The SREB Educational Technology Cooperative is working closely with SREB states to determine how states can share resources to provide Web-based courses for high school students. These efforts are designed to:

- coordinate and assist states in this new, rapidly evolving method of delivering instruction;
- meet students' academic needs through Web-based courses, especially courses in core academic subjects;
- minimize policy-related, instructional, financial and managerial barriers to student access to quality academic courses (for example, ensure that educational materials are adequate, identify possible fiscal arrangements between offering sites and schools, and help identify courses that meet individual states' academic standards); and
- help districts and schools within a state avoid the initial costs and time associated with developing Web-based courses by enabling them immediately to offer online courses that are already available to students.

Conclusion

SREB states will continue to use satellite-delivered television instruction, compressed video and other technologies to deliver courses to high school students. Even so, Web-based courses are very promising because of the level of access by individual users and the capacity for interaction. This relatively new technology has the potential to be a very successful educational tool. While there is an initial focus on developing Web-based courses and on associated technical issues, the policy-related, instructional, financial and managerial issues ultimately will determine whether a course succeeds. As Web-based technology matures in the next several years, policy-makers and decision-makers will need to focus on several key areas:

- **Policy, regulation and legal issues related to developing, offering and receiving courses delivered over the Web:** There are several unresolved issues that need to be addressed. Among these are safety and security, alignment with state academic standards, ownership of courses, teacher workload, teacher contracts and quality controls. Who will be permitted to offer courses for credit to students within each state, and who will make that determination?

- **Financial issues surrounding this new method of delivering instruction:** Who will pay for course development? How will ongoing operations be funded? How will schools or students be charged to take a course, and how much will they have to pay? Will there be technology or materials fees attached to tuition charges?

- **Management issues at the school level:** Using this new technology for instruction will require teachers and administrators to invest a considerable amount of time and attention. Among the issues that need to be addressed are the following: monitoring of student work; technical support for teachers and students using Web-based courses; selection and training of teachers to develop and offer courses; administrative issues regarding the acceptance and recording of courses for credit; dissemination of information about courses to other teachers to ensure schoolwide support; and adequate provision for additional learning resources that students taking Web-based courses will need.

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